

Colorado Bembicidae.

By S. A. JOHNSON AND S. A. ROHWER.

The main object of this paper is to give the distribution, within the State, of the species which are known to occur here, and to add a few species which have hitherto not been reported. The notes are based principally on the collection of the Colorado Agricultural College, but a few species have been taken by the junior author.

To make the paper more complete, tables to separate the genera and species are offered.

The family may be separated into two distinct subfamilies as follows :

- Middle tibiæ with two spurs at apex ; ocelli normal, round. . . STIZINÆ.
- Middle tibiæ with one spur at apex ; ocelli more or less abnormal, especially the anterior one BEMBECINÆ.

STIZINÆ.

Marginal cell much longer than the first cubital ; species large.

Sphecius Dahlb.

Marginal cell much shorter than the first cubital ; both large and small species **Stizus** Latr.

SPHECIUS Dahlb.

This is a small genus, containing but four species in the United States. These are all southern forms. There is but one species known from Colorado, *S. speciosus* Drury. We have two females and a male from Las Animas, Col., August 17, 1901. The thorax is rufous.

STIZUS Latr.

- Species large ; metathorax not emarginate posteriorly (*Megastizus*). . 1.
- Species smaller, about 10 mm. ; metathorax emarginate posteriorly (*Stizus*) 2.

1. Wings mostly blue-black ; first and second transverse cubiti meeting, or nearly so, on the radial ; second dorsal abdominal segment with a rufous band, other segments black. . . **unicinctus** Say.
 Wings hyaline ; first and second transverse cubiti distinctly separated on radial ; abdomen with many pale spots or bands.
brevipennis Walsh.
2. Black, with pale markings **godmani** Cam.
 Yellow, with a few black markings **subalpinus** Ckll.

the spine are yellow. The abdomen above is mostly yellow. The pale markings on the head and thorax are large. Length 10 mm. Many male specimens from Delta, Colo., July 29, 1898.

***Microbembex monodonta argentifrons* Cress.**

This subspecies was described as a distinct species from Cuba by Mr. Cresson.

BEMBIDULA Burm.

This genus is not well represented in Colorado, there being but two species, but an apparently new one is added here. It is from New Mexico. The table is based on the males.

Larger (about 18 mm.); postscutellum black; spots on the abdominal segments much wider at the sides, spots eight in number, growing smaller towards apex ***quadrifasciata* Say.**

Smaller (about 14 mm.); postscutellum marked with yellow; spots of abdomen not or but little wider at the sides, spot on all the segments narrowly separated in the middle 1.

1. Clypeus black; punctures of dorsulum close; tibiae with a black stripe; bands on abdomen rather narrow . . . ***ventralis* Say.**

Clypeus with a large pale spot; punctures of dorsulum larger and more separated; tibiae entirely pale; bands on the abdomen broader ***meliloti* Roh., n. sp.**

***Bembidula ventralis* Say.**

Female, Cope, Colo., Aug. 19, 1905 (S. A. Johnson).

***Bembidula quadrifasciata* Say.**

Female without a label, but probably from Ft. Collins, Colo., having been picked up by a student.

***Bembidula meliloti* Roh., n. sp.—♂.** Length about 14 mm.; clypeus finely closely punctured, along the anterior margin are a few larger punctures; mandibles with two rather small teeth within; front punctured similar to clypeus; first joint of the flagellum a little longer than 2 + 3; apical joints slightly produced beneath; apical joint obliquely truncate; dorsulum punctured with rather large punctures, which are separated (not widely so, however) on the posterior part, the anterior part and near tegulæ they are closer; scutellum punctured like posterior part of dorsulum, if anything, more sparsely so; mesopleura with large, separate punctures; metathorax sculptured like scutellum, or perhaps the punctures are a little closer; angles broadly, obtusely rounded; first joint of anterior tarsi emarginate at base beneath; middle femora with a strong, stout spine at base beneath; abdomen distinctly reticulate, apical

4. Length 20 mm.; abdomen hardly pubescent (Utah) . . **connexus** Fox.
Length 14 mm.; abdomen distinctly pubescent . . **primaestate** n. sp.

Bembex nubilipennis Cress.

Male, Rocky Ford, Colo., July 4, 1904; female, labeled "F. F. C."

Bembex sayi Cress.

Female, Salida, Colo., Oct. 3, 1898; 2 females, Cope, Colo., Aug. 9, 1905 (S. A. Johnson).

Bembex amoena Hdl.

Male, Alamosa, Colo., Aug. 6, 1903; male, Rocky Ford, Colo., July 4, 1904.

Bembex spinolae St. Farg.

Two females, Pueblo, Colo., Aug. 10, 1907 (Hite); female, Sept. 12, 1907, fls. *Chrysothamnus graveolens*, also Oct., 6, 1907, Boulder, Colo. (Roh.). The Boulder ones have a very small spot below tegulae.

Bembex primaestate John. and Roh., n. sp.—♀. Length 14 mm.; clypeus rather irregularly punctured with shallow punctures; mandibles with a small tooth, about one-fourth from apex; front impunctate, or if punctured, very finely so; ocellar region with some distinct punctures; vertex and occiput straight; scape and first flagellar joint of about equal length, first joint of flagellum fully as long as 2 + 3; dorsulum with rather indistinct, close punctures, sparse on posterior part; scutellum with punctures more distinct and separated; mesopleura finely punctured; metathorax punctured as scutellum; anterior tarsi strongly flattened, base of first joint emarginate beneath; pulvilli large and somewhat bent toward apex; abdomen above rather strongly reticulate, apical segments punctured; ventral segments finely reticulate, with some large punctures. Black; clypeus, labrum, mandibles, except apex, which is piceous, scape and flagellum beneath, inner orbits to ocelli, intercellular spot, spot between antennae, a large spot on each side of first abdominal segment above, segments 2-5 with broad bands, which are dentate at the sides (second and third more strongly so), and spot on ventral segments 2, 3, 4, *greenish-white*; posterior orbits, prothorax except a spot in the middle, tegulae, spot above, a spot on each side of scutellum, line on postscutellum, large spot on mesopleura, spot above middle coxae, a large and small spot on metapleura, spot on trochanters, most of femora (more deeply so at sides), tibiae except a small spot beneath at apex, and tarsi, *bright yellow*; wings clear hyaline iridescent; head, thorax and abdomen with long white pile.

Hab.—Denver, Colo., 1889 (S. A. Johnson).

This species runs in Fox's table (Proc. Acad. Nat. Sci. Phil., 1895, p. 354) to *B. connexus* Fox, but it is not that species. It probably is more closely related to *B. spinolae* or *B. amoena*, but may be separated from these species by the foregoing table.

STENIOLIA Say.

Middle tibiae and tarsi simple ; markings bright yellowish.

duplicata Prov.

Middle tibiae and tarsi dilated ; markings greenish-white . *obliqua* Cress.

Steniolia duplicata Prov.

Two females, Cortez, Col., Aug. 10, 1903 ; female, Boulder, Col., Sept. 7, 1907 (Roh.). We have also seen this species from Las Cruces, New Mexico, Aug. 30th, at fls. of *Solidago canadensis* (Townsend). This species has so far only been found on the plains. It is probably a southern form, finding its northern limit in Colorado.

Steniolia obliqua Cress.

Male and female at Florissant, Col., June and July, some at fls. of *Edwinia americana* (Roh.) ; Ward, Col., July, 1905, at fls. of *Gilia* (Ckll.) ; Wet Mountain Valley, Custer Co., Col. (Ckll.). This is the most common Bembicid in the mountains. So far it is not been reported from the plains.

STICTIA Illiger.

Males.

Middle femora smooth beneath ; pulvilli distinct ; second ventral abdominal segment without spines beneath *pectifrons* Sm.

Middle femora carinated or spined beneath 1.

1. Second ventral segment unarmed ; pulvilli distinct *speciosa* Cress.

Second ventral segment with two small tubercles 2.

2. Pulvilli large, distinct ; larger ; femora mostly black. . *emarginata* Say.

Pulvilli small, indistinct ; femora black at base only ; smaller.

pulchella Cress.

Females.

Pulvilli small, indistinct (anterior wings beyond third abdominal segment) *pulchella* Cress.

Pulvilli large, distinct 1.

1. Dorsulum with a U-shaped yellow mark (legs mostly yellow).

speciosa Cress.

Dorsulum without a U-shaped yellow mark 2

2. Femora largely black ; metanotum black ; larger . . . **emarginata** Say.
Femora mostly yellow ; metanotum in part yellow ; smaller.

Stictia pictifrons Sm.

Female, Livermore, Col., July 8, 1900.

Stictia emarginata Say.

Female, Livermore, Col., July 15, 1900.

Stictia speciosa Cress.

Female, Sterling, Col. ; female, Lamar, Col.

Stictia pulchella Cress.

There are no specimens of this species in the collection, but it has been reported from Colorado by Fox, Cresson and Ashmead.

Synopsis and Bibliography of California Siphonaptera.

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The science of preventive medicine is growing apace with the commercial aggrandizement of the tropics and sub-tropics. It is leaving a profound impression on the very vitals of their economics. At present the Pacific metropolis, San Francisco, is in the throes of a sanitary upheaval conducted under the efficient guardianship of the greatest of exponents of preventive medicine, the U. S. Public Health and Marine Hospital Service. The campaign is a reactionary movement against the inroads of the dreaded oriental plague. Science has pointed its finger at the flea as the specific carrier of the pest germ.

The recent epidemic has given the flea a recognition which makes it pre-eminently notorious among insect foes. The following synopsis covers the species recorded in California. There are two species discovered on rats in San Francisco by Past Assistant Surgeon Fox, of the U. S. Public Health and Marine Hospital Service, which have not as yet been described. Dr. Fox is also responsible for the finding of *C. ignotus* on the California gopher. The rat fleas herein recorded have been collected by the writer during an inspection of over two thousand rats from the San Francisco Bay region.